

GCPDev

Developing Applications with Google Cloud

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Developing Applications with Google Cloud

GCPDev - Version: 1

3 days Course

Description:

Learn how to design, develop, and deploy applications that seamlessly integrate components from the Google Cloud ecosystem. This course uses lectures, demos, and hands-on labs to show you how to use Google Cloud services and pre-trained machine learning APIs to build secure, scalable, and intelligent cloud-native applications.

Intended audience:

Application developers who want to build cloud-native applications or redesign existing applications that will run on Google Cloud Platform

Prerequisites:

Completed Google Cloud Fundamentals or have equivalent experience; Working knowledge of Node.js, Java, or Python; Basic proficiency with command-line tools and Linux operating system environments.

Objectives:

Describe best practices for cloud-native application development Differentiate between data storage options for various types of application data Implement a solution for storing non-relational application data in Datastore



Implement storage solution for objects (binary and large files) using Cloud Storage

Topics:

Best Practices for Application Development

- • Code and environment management
- • Design and development of secure, scalable, reliable, loosely coupled application
- components and microservices
- • Continuous integration and delivery
- • Re-architecting applications for the cloud
- Objectives
 - ^o Design and develop secure, scalable, reliable, loosely coupled application
 - ^o components and microservices.
 - ^o Understand how to rearchitect applications for the cloud.
- Activities
 - º Module quiz

Overview of Data Storage Options

- • Overview of options to store application data
- • Use cases for Cloud Storage, Firestore, Cloud Bigtable, Cloud SQL,
- and Cloud Spanner
- • Demo: Connecting Securely to a Cloud SQL Database
- Objectives

^o Choose the appropriate data storage option for application data.

- Activities
 - ^o 1 demo and 1 quiz

Best Practices for Using Datastore



- • Best practices related to using Firestore in Datastore mode for:
- • Queries
- • Built-in and composite indexes
- • Inserting and deleting data (batch operations)
- • Transactions
- • Error handling
- • Demo: Explore Datastore
- • Demo: Use Dataflow to Bulk-load Data into Datastore
- • Lab: Storing Application Data in Datastore
- Objectives
 - ^o Understand best practices related to queries, built in and composite indexes,
 - ^o inserting and deleting data (batch operations), and transactions error handling.
- Activities.
 - ^o 2 demos, 1 lab, and 1 quiz

Performing Operations on Buckets and Objects

- • Cloud Storage concepts
- • Consistency model
- • Demo: Explore Cloud Storage
- • Request endpoints
- • Composite objects and parallel uploads
- • Truncated exponential backoff
- • Demo: Enable CORS Configuration in Cloud Storage
- • Understand Cloud Storage concepts.
- • Differentiate between strongly consistent and eventually consistent operations.
- • Access Cloud Storage through request endpoints.
- • Use object composition to upload an object in parallel.
- • Use truncated exponential backoff to deal with network failures.
- Objectives
 - Understand Cloud Storage concepts.



- ^o Differentiate between strongly consistent and eventually consistent operations.
- Access Cloud Storage through request endpoints.
- Use object composition to upload an object in parallel.
- ^o Use truncated exponential backoff to deal with network failures.
- Activities
 - ^o 2 demos and 1 quiz

Best Practices for Using Cloud Storage

- • Naming buckets for static websites and other uses
- • Naming objects (from an access distribution perspective)
- • Performance considerations
- • Lab: Storing Image and Video Files in Cloud Storage
- Objectives
- Activities
 - º 1 lab and 1 quiz

Handling Authentication and Authorization

- • Identity and Access Management (IAM) roles and service accounts
- • User authentication by using Firebase Authentication
- User authentication and authorization by using Identity-Aware Proxy
- • Lab: Adding User Authentication to your Application
- Objectives
 - ^o Implement federated identity management.
- Activities
 - ⁰ 1 lab and 1 quiz

Using Pub/Sub to Integrate Components of Your Application



- • Topics, publishers, and subscribers
- • Pull and push subscriptions
- • Use cases for Pub/Sub
- • Lab: Developing a Backend Service
- Objectives
 - ^o Understand Pub/Sub topics, publishers, and subscribers.
 - ^o Understand pull and push subscriptions.
 - Explore use cases for Pub/Sub.
- Activities
 - º 1 lab and 1 quiz

Adding Intelligence to Your Application

- Overview of pre-trained machine learning APIs such as the Vision API and the Cloud
- Natural Language Processing API
- Objectives

^o Explore pre-trained machine learning APIs such as Cloud Vision API and Cloud
 ^o Natural Language API.

- Activities
 - º 1 quiz

Using Cloud Functions for Event-Driven Processing

- • Key concepts such as triggers, background functions, HTTP functions
- • Use cases
- • Developing and deploying functions
- • Logging, error reporting, and monitoring
- • Demo: Invoke Cloud Functions Through Direct Request-response
- • Lab: Processing Pub/Sub Data using Cloud Functions
- Objectives



- ^o Use Cloud Functions for event-driven processing.
- Activities
 - ^o 1 demo, 1 lab, and 1 quiz

Managing APIs with Cloud Endpoints

- • Open API deployment configuration
- • Lab: Deploying an API for the Quiz Application
- Objectives
 - ^o Understand OpenAPI deployment configuration.
- Activities

Deploying Applications

- • Creating and storing container images
- • Repeatable deployments with deployment configuration and templates
- • Demo: Exploring Cloud Build and Cloud Container Registry
- • Lab: Deploying the Application into Kubernetes Engine
- Objectives
 - ^o Understand how to create and store container images.
 - ^o Create repeatable deployments with deployment configuration and templates.
- Activities

Compute Options for Your Application

- Considerations for choosing a compute option for your application or service:
- • Compute Engine
- • Google Kubernetes Engine (GKE)
- • Cloud Run
- • Cloud Functions



- • Platform comparisons.
- • Comparing App Engine and Cloud Run
- Objectives
 - ^o Explore considerations for choosing a compute option for your application
 ^o or service.
- Activities
 - º 1 quiz

Debugging, Monitoring, and Tuning Performance

- • Google Cloud's operations suite
- • Managing performance
- • Lab: Debugging Application Errors
- • Logging
- • Monitoring and tuning performance
- • Identifying and troubleshooting performance issues
- • Lab: Harnessing Cloud Trace and Cloud Monitoring
- Objectives
 - ${}^{\underline{o}}$ \bullet Debug an application error by using Cloud Debugger and Error Reporting.
 - ^o Use Cloud Monitoring and Cloud Trace to trace a request across services, observe,
 ^o and optimize performance.
- Activities
 - º 1 demo, 2 labs and 1 quiz